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EXAMINER	
BOOKER, KELVIN E	

ART UNIT	PAPER NUMBER
2121	

DATE MAILED: 09/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/787,212	UGAJIN ET AL.	
	Examiner	Art Unit	
	Kelvin E Booker	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 May 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☒ Other: *Detailed Office Action*.

DETAILED ACTION

Response to Amendment

1. In the amendment filed May 21, 2004, the title has been amended to further define the intended invention; **claims 1-11** have been amended; and **claims 12-23** have been added. **Claims 1-23** are presented for further consideration.

Response to Arguments

2. Applicant's arguments with respect to **claims 1-3** have been considered but are moot in view of the new ground(s) of rejection.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested:

A Method of Fabricating a Fractal Structure for Constructing Complex Neural Networks.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. **Claims 1-23** are rejected under 35 U.S.C. 101 because the invention as disclosed in **claim one** is directed to non-statutory subject matter. While the claim is in the technological arts, it is not limited to practical applications in the technological arts.

Specifically, the claims address a series of steps to be performed on a computer, but the idea is disclosed abstractly from any particular practical application. **Claim one** focuses on the steps necessary for governing *a method of growing and coupling fractal structures*, but fails to provide a process that generates a given result. The claim merely discloses a list of steps for executing a process, but does not provide a resultant based upon the disclosed process.

To constitutionally interpret the word "process", the Supreme Court has held that: "***A process is a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject matter to be transformed and reduced to a different state or thing. ***The Process requires that certain things should be done with certain substances, and in a certain order; but the tools to be used in doing this may be a secondary consequence."(emphasis added) Diamond, Commission of Patents and Trademarks v. Diehr and Lutton, 209 USPQ 1, 6 (1981) quoting Cochrane v. Deener, 94 U.S. 780, 787-788 (1876).

This Constitutional interpretation of the word "process" is a long-standing one that the Supreme Court requires to be applied in interpreting 35 USC 101. Diamond v. Diehr at 6. Consequently, the us of that interpretation is Constitutionally required when we interpret the Federal Circuit's standard that a "new and useful process" is one that produces a useful, concrete, and tangible result". Cf. State Street Bank & Trust Co. v. Signature Financial Group, Inc., 47 USPQ2d 1596, 1600-1601 (Fed. Cir. 1998).

Applicant discloses no "certain substances" that have been "transformed or reduced" in that applicant's claims disclose no specific computer-readable medium, no manipulation of specific data representing physical objects or activities (pre-computer activity), nor do they disclose any specific independent physical acts being performed by the invention (post-computer activity). The claims merely manipulate abstract ideas in general without limitation to a practical application where "certain substances" are transformed or reduced.

Further, **claims 1-23** are directed at a method of growing and coupling fractal structures without disclosing any computer implemented processing. Abstract ideas (see Warmerdam, 33 F.3d at 1360, 31 USPQ2d at 1759) or the mere manipulation of abstract ideas (see Schrader, 22 F.3d at 292-93, 30 USPQ2d at 1457-58) are not patentable.

As disclosed, independent **claim one** focuses on nonfunctional descriptive material, which is inclusive of the mere arrangement of data without engaging functionality when employed as a computer component.

Claims 2-23 do not cure the defect in claim one. On this basis, **claims 1-23** are rejected under 35 USC 101.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. **Claims 1-23** are rejected under 35 U.S.C. 102(b) as being anticipated by Kotsavasiloglou et al., "Model for a Neural Network Structure and Signal Transmission" [hereafter Kotsavasiloglou].

As per claim 1, Kotsavasiloglou teaches of a method comprising the steps of:

A. growing a first fractal structure from a start site (see page 4491, column 1, paragraph 3 through column 2, paragraph 1: growth of a first structure);

B. growing a second fractal structure from a second start site (see page 4491, column 1, paragraph 3 through column 2, paragraph 1: growth of a second structure respective of the first); and

C. coupling said first fractal structure to said second fractal structure during the step of growing said second fractal structure (see page 4491, column 1, paragraph 3 through column 2, paragraph 1: coupling the two structures during the growth of the second structure with respect to the initial structure).

As per claim 2, Kotsavasiloglou teaches of a method further comprising the step of:

determined a growth rate based on a probability that a material reaches a portion already grown from said second start site in a diffusion process, and a probability that a growth promotion factor reaches the portion already grown from portions grown from said *second start site* in a diffusion process, wherein said first fractal structure is grown at said growth rate (see page 4492, column 1, paragraph 3: "all synapses are characterized...transmitted to other neurons"; and page 4493, column 1, paragraphs 2-3: growth rate based on probability respective of synaptic activity).

As per claim 3, Kotsavasiloglou teaches of a method wherein said growth rate is proportional to a product of a power function of the probability that a material reaches a portion already grown from said second start site in a diffusion process, and a power function of the probability that a growth promotion factor reaches the portion already grown from portions crown from said second start site in a diffusion process (see page 4492, column 1, paragraph 4; and page 4493, column 2, paragraph 2: analyzing structural growth respective to diffused power).

As per claim 4, Kotsavasiloglou teaches of a method further comprising the step of adjusting a parameter to control fractal property, self-similarity, complexity of the structure, or the number of coupling (see page 4492, column 1, paragraph 4: controlling the density of the structures by controlling synaptic properties).

As per claim 5, Kotsavasiloglou teaches of a method further comprising the step of adjusting a parameter to control fractal property, self-similarity, complexity of the structure, or the number of coupling (see page 4492, column 1, paragraph 4: controlling the density of the structures by controlling synaptic properties).

As per claim 6, Kotsavasiloglou teaches of a method wherein said parameter comprises the relative potential determining diffusion of the growth promotion factor of said *first fractal structure* in an appropriate relation to a site at infinity (see page 4492, column 1, paragraph 4: controlling the structures growth potential).

As per claim 7, Kotsavasiloglou teaches of a method wherein said parameter comprises the relative potential determining diffusion of the growth promotion factor of said *first fractal*

structure in an appropriate relation to a site at infinity (see page 4492, column 1, paragraph 4: controlling the structures growth potential).

As per claim 8, Kotsavasiloglou teaches of a method wherein an *anisotropy* [e.g., "*a coupled-fractal network*", specification page 20, line 25] is introduced into a space in which said fractal structures are grown (see page 4492, column 1, paragraph 5 through column 2, paragraph 1: analyzing the space governing coupled-fractals by evaluating synaptic delays).

As per claim 9, Kotsavasiloglou teaches of a method wherein diffusion coefficient in a space in which said fractal structures are grown has an *anisotropy* (see page 4492, column 1, paragraph 5 through column 2, paragraph 1: analyzing synaptic delay diffusion coefficients respective of fractal growth patterns).

As per claim 10, Kotsavasiloglou teaches of a method further comprising the step of adjusting a parameter to control fractal property, self-similarity, complexity of the structure, or the number of coupling (see page 4492, column 1, paragraph 4: controlling the density of the structures by controlling synaptic properties).

As per claim 11, Kotsavasiloglou teaches of a method further comprising the step of adjusting a parameter to control fractal property, self-similarity, complexity of the structure, or the number of coupling (see page 4492, column 1, paragraph 4: controlling the density of the structures by controlling synaptic properties).

As per claim 12, Kotsavasiloglou teaches of a method further comprising the step of:

determining a growth rate based on a probability that a material reaches a portion already grown from said first start site in a diffusion process, and a probability that a growth promotion factor reaches the portion already grown from portions grown from said *first start site* in a

diffusion process, wherein said second fractal structure is grown at said growth rate (see page 4492, column 1, paragraph 3: "all synapses are characterized...transmitted to other neurons"; and page 4493, column 1, paragraphs 2-3: growth rate based on probability respective of the synaptic activity of N-fractal structures).

As per claim 13, Kotsavasiloglou teaches of a method wherein said growth rate is proportional to a product of a power function of the probability that a material reaches a portion already grown from said first start site in a diffusion process, and a power function of the probability that a growth promotion factor reaches the portion already grown from portions grown from said first start site in a diffusion process (see page 4492, column 1, paragraph 4; and page 4493, column 2, paragraph 2: analyzing structural growth respective to diffused power).

As per claim 14, Kotsavasiloglou teaches of a method further comprising the step of adjusting a parameter to control fractal property, self-similarity, complexity of the structure, or the number of coupling (see page 4492, column 1, paragraph 4: controlling the density of the structures by controlling synaptic properties).

As per claim 15, Kotsavasiloglou teaches of a method further comprising the step of adjusting a parameter to control fractal property, self-similarity, complexity of the structure, or the number of coupling (see page 4492, column 1, paragraph 4: controlling the density of the structures by controlling synaptic properties).

As per claim 16, Kotsavasiloglou teaches of a method wherein said parameter comprises the relative potential determining diffusion of the growth promotion factor of said *first fractal structure* in an appropriate relation to a site at infinity (see page 4492, column 1, paragraph 4: controlling the structures growth potential).

As per claim 17, Kotsavasiloglou teaches of a method wherein said parameter comprises the relative potential determining diffusion of the growth promotion factor of said *first fractal structure* in an appropriate relation to a site at infinity (see page 4492, column 1, paragraph 4: controlling the structures growth potential).

As per claim 18, Kotsavasiloglou teaches of a method wherein said parameter comprises the relative potential determining diffusion of the growth promotion factor of said *second fractal structure* in an appropriate relation to a site at infinity (see page 4492, column 1, paragraph 4: controlling structural growth potential of N-fractal structure).

As per claim 19, Kotsavasiloglou teaches of a method wherein said parameter comprises the relative potential determining diffusion of the growth promotion factor of said *second fractal structure* in an appropriate relation to a site at infinity (see page 4492, column 1, paragraph 4: controlling structural growth potential of N-fractal structure).

As per claim 20, Kotsavasiloglou teaches of a method wherein said parameter comprises the relative potential determining diffusion of the growth promotion factor of said *second fractal structure* in an appropriate relation to a site at infinity (see page 4492, column 1, paragraph 4: controlling structural growth potential of N-fractal structure).

As per claim 21, Kotsavasiloglou teaches of a method wherein said parameter comprises the relative potential determining diffusion of the growth promotion factor of said *second fractal structure* in an appropriate relation to a site at infinity (see page 4492, column 1, paragraph 4: controlling structural growth potential of N-fractal structure).

As per claim 22, Kotsavasiloglou teaches of a method wherein diffusion coefficient in a space in which said fractal structures are grown has an *anisotropy* (see page 4492, column 1,

paragraph 5 through column 2, paragraph 1: analyzing synaptic delay diffusion coefficients respective of fractal growth patterns).

As per claim 23, Kotsavasiloglou teaches of a method further comprising the step of adjusting a parameter to control fractal property, self-similarity, complexity of the structure, or the number of coupling (see page 4492, column 1, paragraph 4: controlling the density of the structures by controlling synaptic properties).

8. In the remarks, Applicants argue in substance that the cited reference fails to teach "*coupling the first fractal structure to the second fractal structure during the step of growing the second fractal structure*".

9. In response to the Applicant's argument, the Examiner respectfully disagrees. On page 4491, column 1, paragraph 3 through column 2, paragraph 1, Kotsavasiloglou clearly teaches of locating one neuron at a site, and growing a second neuron respective of the first. If the second [or N-neuron] grows in close proximity to first, *anisotropy* is introduced to the system, and a portion of the fractal structures are joined and grow with regards to environmental parameters.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

A. Dissado et al., "Propagation of Electrical Tree Structures in Solid Polymeric Insulation";

B. Culver et al., "Computer Simulation of a Brain Slice Using Fractals";

C. Bieberich, "Structure of Human Consciousness: A Fractal Approach to the Topology of the Self Perceiving an Outer World in an Inner Space";

D. Selvam, "Cantorian Fractal Spacetime and Quantum-like Chaos in Neural Networks of the Human Brain"; and

E. Lin et al., "Hierarchy-Induced Isotropy-Anisosotropy Transition on a Fractal Resistor Network".

12. An inquiry concerning this communication or earlier communications from the examiner should be directed to Kelvin Booker whose telephone number is (703) 308-4088. After October 13, 2004, Mr. Booker can be reached at (571) 272-3681. The examiner can normally be reached on Monday-Friday from 7:00 AM-5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight, can be reached on (703) 308-3179. After October 13, 2004, Mr. Knight can be reached at (571) 272-3687. The fax number for the organization where this application or proceeding is assigned is (703) 872-9306.

An inquiry of a general nature or relating to the status of this application proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Anthony Knight
Supervisory Patent Examiner
Group 3600

K.E.B.

Art Unit 2121

September 8, 2004